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A SYSTEM OF OPHTHALMIC OPERATIONS

Being a Complete Treatise on the Operative Conduct of
Ocular Diseases and Some Extraocular Conditions
Causing Eye Symptoms.

Edited and Partly Written by

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"A horizontal or vertical incision is made into the conjunctiva on the inner side of the globe. The adductor muscle is seized, divided through its tendon and guarded by a catgut suture which is passed through the tendon and the conjunctiva. The capsule is separated above and below and the optic nerve is sectioned in the ordinary manner. The posterior pole of the eyeball is seized with a tenaculum and is drawn forward. It is separated from the oblique muscles and is drawn through the conjunctival opening, after which the posterior portion of the globe is exsected up to the insertion of the rectus muscles. The conjunctival opening is closed, and the tendon of the internal rectus muscle is secured. An accumulation of blood back of the cornea forces the eyeball forward but this, he says, is removed by compression.

Convalescence is more rapid than in total enucleation, and the results are an excellent stump with the conjunctiva entire.

Sympathetic ophthalmitis is avoided, the anatomic-pathologic collectors alone being the losers."

L. Müller,²⁸⁵ in 1908, practised a similar operation.

Nicati's statement should not be allowed to pass unchallenged as sympathetic ophthalmia is not always averted, as evidenced by cases



Fig. 275.

Preparatory Evisceration for Huizinga's Operation.

cited by Trousseau²⁸⁶ and Rohmer²⁸⁷ in 1893, Pflüger,²⁸⁸ Clausen,²⁸⁹ Schweigger,²⁹⁰ Krones,²⁹¹ and others, after the performance of this operation.

THE TRANSPLANTATION OF ANIMALS' EYES INTO HUMAN SOCKETS.

The transplantation of a rabbit's eye into the human orbit has up to the present time resulted in little more than the exploitation of a

²⁸⁵Müller. Die Resektion des Augenapfels, *Wiener Klin. Wochenschr.*, Dec. 3, 1908.

²⁸⁶Trousseau. Un cas d'ophtalmie sympathique. *Mém. de la Soc. d'Ophthalm. de Paris*, April 7, 1891.

²⁸⁷Rohmer. La resection du nerf optique d'après le procédé de M. de Wecker. *Annals d'oculist.*, April, 1892.

²⁸⁸Pflüger. International Med. Congress, Paris, 1900.

²⁸⁹Clausen. Rohmer, *Annales d'Oculist.*, April, 1892.

²⁹⁰Schweigger. *Idem*.

²⁹¹Krones. *Idem*.

surgical curiosity, but extending some slight encouragement for future investigation. While a few experiments have produced movable, and more or less prominent, stumps by such procedures, no case has as yet been reported where vision has been produced and in the very nature of things it is exceedingly improbable that such a result will ever be attained. It must be mentioned, however, that S. Zervos, (*Grèce Médicale*, Vol. XII, No. 1 and 2, 1909) narrates some wonderful results in transplanting testicles, kidneys, spleens and eyeballs from one animal to another. He claims that eyes from young animals can be successfully transplanted and that they will resume their functions. Certainly, further proof is necessary before such astounding claims will be accepted. It is difficult to see how the stump-producing

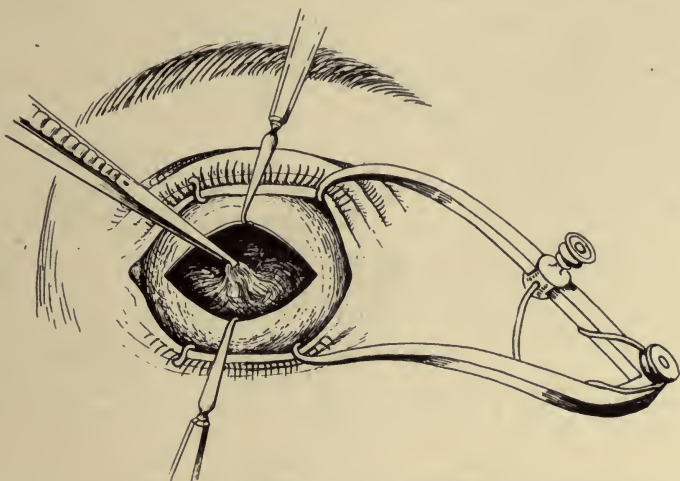


Fig. 276.

Operation of Huizinga. Grasping the Sclera from the Inside of the Eye.

results of these experiments are really superior to a well-performed enucleation, where the muscles, conjunctiva, etc., are all sutured together, as described in earlier portions of this Chapter, since under the most favorable circumstances the implanted eyeball shrinks to one-half or one-third of its original volume. The results certainly cannot be compared in their cosmetic quality to a Mules' operation.

Some operators merely adjust the rabbit's eyeball into the space just vacated by the human globe and attach the muscles, conjunctiva, etc., to the implanted sphere; others also unite the ends of the two optic nerves.

The first experiment was made by Chibret,²⁹² May 4th, 1885, on a

²⁹²Chibret. *Bull. de l'Académie de Médecine de Paris*, May 28, 1885. Also, *Revue Générale d'Ophtal.*, May 31, 1885.

girl of seventeen years. He implanted a rabbit's eye by suturing the patient's conjunctiva to the rabbit's cornea. The cornea, of course, sloughed, as might have been expected, and the operation was a failure. Terrien,²⁹³ a little later in 1885, reported another failure and Rohmer,²⁹⁴ still later in 1885, reported another. Bradford,²⁹⁵ still later in 1885, reported a fourth case, which he claimed as successful. This operator united the two optic nerves, and the two conjunctivæ, as well as the muscles of the orbit to the implanted globe. The records of this case, however, disclosed the fact that within a year the cornea became opaque, wrinkled and sclerosed, and while no pain, inflammation or discharge was present, it was deemed best to remove the eye. Terrien²⁹⁶ later, in 1885, followed Bradford's plan, but did not succeed.

May,²⁹⁷ in 1886, performed a valuable series of experiments on 24

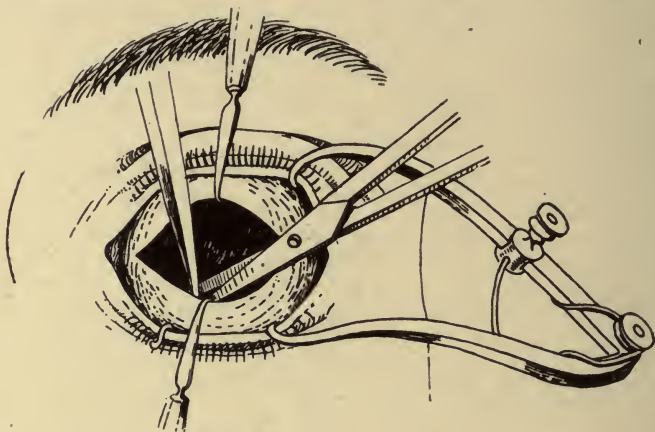


Fig. 277.

Operation of Huizinga. Cutting Away a Portion of the Sclera from the Inside of the Eye.

rabbits into whose sockets he implanted the eyeballs of other rabbits. He established the fact that the operation is entirely feasible, but whether it is profitable or not is quite another matter when we consider that the rabbit's eye is much smaller than the human eye and that after a successful operation it shrinks to from one-half to one-third its original size.

May says that the tissues of the socket and the implanted eyes heal promptly and that muscular movement is evident in from 3 to 16

²⁹³Terrien. Report to the *Société de Chir. of Paris*, 1885.

²⁹⁴Rohmer. Beard's *Ophthalmic Surgery*, 1910, p. 467.

²⁹⁵Bradford. A Case of Enucleation with Replacement of the Human Globe by that of a Rabbit. *Boston Med. & Surg. Journ.*, Sept., 1885, p. 269.

²⁹⁶Terrien, *loco cit.*

²⁹⁷May. Enucleation with Transplantation and Reimplantation of Eyes. *N. Y. Med. Record*, May 29, 1886, p. 613.

days. He had sloughing in 9 cases, but some kind of an eyeball was preserved in all cases; small in some and larger in others. He claimed that the optic nerves became united in all cases.

In 1901 Lagrange²⁹⁸ instituted some experiments in grafting a rabbit's eye into a human socket. He warns surgeons not to be influenced by Rohmer's failures as his technic was faulty, he having deposited the rabbit's eye into the human capsule of Tenon before bleeding had ceased. He used purse-string instead of interrupted sutures, with the rabbit and human muscles nicely approximated. He regards the following rules as essential to success:

1. That, as each rectus is cut, a thread be passed through it to prevent its retraction.
2. Following enucleation, that the eye be not inserted until all hemorrhage has ceased.
3. That an eye of a *young* rabbit be selected.
4. That the opposite muscles be drawn into apposition by appropriate sutures.
5. That the sutures in the conjunctiva be close together and be allowed to remain a week.
6. That the most careful antisepsis be carried out."

In 1905 Lagrange²⁹⁹ still further improved his technic, by protecting the cornea from those influences which favor its necrosis. His features of improvement are enumerated as follows:

"The rabbit's eye is placed into Tenon's capsule with the cornea turned *downward* and then the several muscles of the patient's eye are sutured to the posterior pole of the rabbit's eye. Rolling up of the muscles can be prevented by flattening them out. This method of implantation should not be used after enucleation on account of iridocyclitis and panophthalmitis, where the capsule of Tenon is implicated in the process. The implanted eye shrinks in the course of time, but there usually remains enough of a stump for the artificial eye to facilitate its mobility. Out of 11 cases observed, 8 showed a very good result. The longest time of observation was 4 years."

In 1907 Lagrange³⁰⁰ modified his operation by placing the eye of the rabbit *directly backwards*, as the sclerotic is better able to withstand the pressure of the threads than the cornea.

Wicherkiewicz,³⁰¹ reports the results of 35 implantations of the rabbit's eye, which he performed in his clinic. His conclusions are as follows:

1. The implanted and sutured eyeball becomes well attached to the straight muscles and acquires normal movements.
2. The course of healing, considering the operation, is comparatively short.
3. The connection of the implanted globe with the surrounding tissues

²⁹⁸Lagrange. Heteroplastie orbitaire par la greffe d'un oeil de lapin dans la capsule de Tenon. *Ann. d'Oculist.*, 1901, p. 369.

²⁹⁹Lagrange. De l'amélioration de la prothèse oculaire par la greffe de l'oeil de lapin. *Ann. d'Oculist.*, May, 1905, p. 391.

³⁰⁰Lagrange. De l'amélioration de la prothèse oculaire par la greffe d'un oeil de lapin. *Arch. d'ophtal.*, March, 1907, p. 150.

³⁰¹Wicherkiewicz. The Transplantation of the Rabbit's Eye into Tenon's Capsule. Trans. from *Pastep. Okulist.*, No. 7, 1908.

is intimate, as, for instance, a recurrent neoplasm, not only the orbital tissues but the rabbit's eye itself grows fast.

4. In course of time the implanted globe becomes one-half or one-third the original size.

5. The older the subject the greater is the shrinking of the globe, which sometimes becomes so atrophic that it cannot be felt.

6. In no instance has the implantation given rise to sympathetic symptoms in the other eye."

From longer observation Wicherkiewicz is inclined to restrict this heteroplasty to children or young subjects, on account of the atrophy of the implanted globe. In 1909 he followed the plan of Lagrange and



Fig. 278.

The Socket after the Implantation of a Rabbit's Eye.

advocated the turning of the cornea directly backward to protect the cornea, by keeping it warm and guarding it from outside influences. It was also found that in this position better motion could be obtained than if the eye was turned downward, as first proposed by Lagrange.

I have never performed this operation, but would suggest that the cornea may be amply protected by placing it well forwards within the capsule of Tenon, and then uniting with catgut sutures the muscles of the patient to the stump of muscles left on the rabbit's eye. The

undermined conjunctiva might then be sutured over the implanted eyeball.

GIFFORD OPERATION FOR SIGHTLESS STUMPS.

Gifford (*Archives of Ophthalmology*, Vol. 31, No. 2) has suggested an operation for the protection of the cornea, in some sightless eye stumps, where the patient will not consent to an enucleation or evisceration, and yet desires to wear an artificial eye but is deterred from so doing on account of a sensitive cornea. His remarks and directions for operating are as follows:

"I believe that many sightless stumps are worth preserving, as they make the best possible support for an artificial eye; and as being entirely harmless if, after once becoming quiet, they can be kept from being infected. Where such a stump has any considerable amount of cornea left, this sometimes becomes irritated when an artificial eye is worn, and often drives the patient to the oculist with the request that the stump be removed in order that a shell may be worn with comfort. In another class of cases, the amount of cornea left is so small that it would not be irritated by the artificial eye, but, having been penetrated either by an ulcer or a wound, bits of the iris tissue are exposed in the scar so as to become not only a source of irritation, but possibly of deep-seated and dangerous infection. In the third class, the eyeball may be quite natural-looking, but on account of its distorted nutrition, either from glaucoma or from some other cause which impairs the vitality of the corneal epithelium, it is subject to frequent attacks of corneal ulceration which render the ball a nuisance. In all of these cases I have been accustomed for the last six years to cover the cornea either with a conjunctival flap, a Thiersch flap, or an epithelial lip flap. Where, as in the majority of cases, conjunctiva is used, the membrane is excised around the lower half of the cornea for an area about 3-16 of an inch wide at the sides, and $\frac{1}{8}$ inch below. Above this zone the membrane is dissected free from the globe as far as the upper fornix in the neighborhood of which a cross cut is made through the membrane to allow it to be slid down over the cornea without putting too much tension on it. Three sutures below are generally sufficient, but these should be put well into the episcleral tissue, nearly as deeply as in the advancement of one of the straight muscles. It may be asked why not accomplish the same thing by dissecting up the conjunctiva both above and below and sewing it together in a straight line across the centre of the cornea. This is the method which first occurred to me and which I tried without success, both on men and rabbits. It proved to be practically impossible to bring enough raw surface from each side into contact to produce a firm union. As soon as the stitches came out, the conjunctiva slipped gradually back, leaving the cornea nearly as much exposed as before. This is the reason for putting the stitches into the episcleral tissue after denuding the sclera below the cornea. Unless this is done, the tension on the upper flap is apt to pull up the conjunctiva from below, so that the line of sutures lies across the cornea and firm union does not take place.

Where, from any cause, the conjunctiva is atrophic and the space for an artificial eye would be too much limited by the operation just described, I use an epithelial lip flap (i. e., a thin flap shaved from the lip with a razor), or a Thiersch flap. The conjunctiva having been dissected up for $\frac{1}{8}$ of an inch around the cornea, and the cornea having been scraped (special care being taken in the neighborhood of the limbus), the flap is spread out carefully over the cornea and tucked under the loose conjunctiva on all sides. It is well to bandage both eyes for twenty-four hours after these operations. I have used the Thiersch flap for this purpose only once, because, although it healed on perfectly, the accumulation of dead epidermis on its surface caused some irritation and I scraped the skin flap off and substituted a lip flap for it. I think, however, that the irritation could have